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DAM PACKAGE VERSION 7807:
SOFTWARE FIXES AND ENHANCEMENTS

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E. H. Schlosser
Lockheed Electronics Company, Inc.
Systems and Services Division
Houston, Texas 77058

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LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS 77058



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The number of display/map print files at Austin, Texas, and Richland, Washington, will be as follows:

Program	Number of display/map print files		
	Default	Minimum	Maximum
PICTAB	1	1	4
CLASSIFY	1	0	1
PRTDENS	1	1	1
PRTCLASS	4	1	9

2.3 SUPPRESSING SPECTRAL LIMITS DISPLAY FILE

If the user employs the PRINTER command in the CLASSIFY program to specify 0 files, then the print file containing plots of the spectral limits and summary information on the detection window will not be generated.

3. ERRORS AND FIXES

All errors encountered up to December 1, 1978, have been fixed.

3.1 ERRORS CORRECTED

UNIVAC symbiont error "TYPE 2, CODE 45" (input/output error on creating output alternate print file) was caused by exceeding the assigned file size (eight positions). This has been fixed by doubling alternate print file size to sixteen positions.

UNIVAC input/output error "TYPE 1, CODE 21" (attempt to reference file name for which no assignment has been made) was caused by failure to check for null "DO" loop parameters when reading density files in subroutine READ2N. This has been fixed by inserting an explicit test before the "DO" loop.

DAM.PRTCLASS fatal error "READ2N LINE ERROR" was caused by failing to read from density files when the first scan line of a map was the same as the last scan line of the immediately preceding map. This has been fixed by modifying READ2N so it always reads from the density files.

3.2 KNOWN ERRORS

The following error encountered in early December (after the release of version 7807) has been diagnosed and corrective patches will be made to version 7807 in the field.

Garbled data, with the upper left corner of the scene (or strip) repeated at other locations within the scene, may be written into the density files by CLASSIFY if the tape drive malfunctions and the operator repositions the tape to the beginning without reporting this to the program (through the operating system). Although this causes error termination of CLASSIFY, the density file(s) are not marked as defective. A fix to mark the density files as defective has been developed for field installation.

4. MISCELLANEOUS ENHANCEMENTS

Detailed syntax for these new capabilities is given in appendix A.

4.1 SUPPRESSING UNIT 0

Both RPC's requested the capability in PRTCLASS to selectively suppress the symbol legend and tick table on UNIT 0 for specific maps or groups of maps. This has been implemented under the control of the new LEGEND mode option. To initiate suppression of UNIT 0, enter OFF,LEGEND. To enable printing of UNIT 0, enter ON, LEGEND. The default LEGEND setting is ON, and it is recommended that the 1:250,000 overview map be generated with UNIT 0.

4.2 ARCHIVE DETECTION FILES

The COE had requested the ability to archive detection files on tape as the first phase of a change detection capability. The new DITCOP program has been developed to support this. DITCOP should only be used where there is need to use the same density files at least three or four times on different dates. If this is not the case, it will generally be cheaper to recreate the density files afresh rather than save them on tape and then restore them to disk.

4.3 NEW DEFAULTS

The default values for some mode options have been changed to reduce the amount of printed output from batch runs, as requested by the RPC's.

4.4 SIMPLIFIED RUNSTREAM

Two @ADD elements, developed for the Western RPC to reduce the amount of repetitive keypunching, when all four strips on a single reel of tape are to be processed, are included in the new software version. Their usage is as follows:

...	...
@ASG,BOTV 3.,U9,tape#	@ASG,BOTV 3.,U9,tape#
@LOCATE,L 3.,1	@LOCATE,L 3.,1
@XQT PICTAB	@XQT CLASSIFY
user-commands	user-commands
EXIT	EXIT
@ADD DAM.PICTAB-1-4	@ADD DAM.CLASSIFY-1-4
@FREE 3.	@FREE 3.
@FIN	@XQT PRTCLASS
	...

5. DETECTING MIXTURE PIXELS

The standard spectral limits provided with the DAM software classify as water (regardless of depth, turbidity, or sun elevation angle) only those MSS pixels whose surface is entirely water. Water-land mixture pixels at the edge of a water body are spectrally similar to water-land mixture pixels within a marsh, and so are not classified as water. (Certain pixels in shadowed, urban, and industrial areas are also similar spectrally to these water-land mixture pixels.)

The approach described above has the advantage of minimizing "false alarms" (pixels classified as part of a water body when they are not), but the disadvantage of missing edge pixels along the shores of water bodies. In the case of water bodies narrower than twice the MSS instantaneous field of view (IFOV), or 158 meters (2 times 79), a body may contain no non-edge pixels and so be missed entirely; or its non-edge pixels may be discontinuous.

Most attendees at the DAM Package Users Conference, held October 11-12, 1978, at the Eastern RPC in Nashville, Tennessee, felt strongly that pixels spectrally close to water should no longer be ignored, but instead mapped with different symbols than those used for water. The remainder of this report details the technical approach, software modifications, and user interpretation involved in achieving this goal.

5.1 TECHNICAL APPROACH

At least two distinct factors enter into estimating the probability that a pixel not 100 percent water nevertheless contains a significant percentage of surface water:

- o Spectral distance from spectral limits for water
- o Spatial distance from pixels which are 100 percent water

In other words, a pixel is more likely to contain some water if it is spectrally very similar to water or if several pixels contiguous to it are 100 percent water. If both these factors are favorable, then the probability of having a water-land mixture is increased even more; hence these factors are additive.

5.2 SOFTWARE IMPLEMENTATION

The internal detection files, created by the CLASSIFY program to store density data for each pixel, and used by the PRTCLASS program in generating maps, have been modified as follows:

- a. Pixels with densities between 10 and 19 are 100 percent water.
- b. Pixels with densities between 0 and 9 are not 100 percent water.
- c. Density values below 10 represent the probability that a pixel is partly water.
- d. These density values under 10 equal the count of pixels adjacent in space (8 maximum) which are 100 percent water plus 1 if the pixel itself is "spectrally close" to water.
- e. "Spectrally close" to water means within a certain user-specified TOLERANCE of the spectral limits for water.

The PRTCLASS program reads the internal detection files and examines the densities for all pixels which register to each map print character. All pixels outside the current (default or user-specified) density range are ignored. For each map print character, the densities of all its pixels within the current density range are added up and this total count printed with the equivalent symbol. Thus, the count added for any individual pixel may range from 0 through 19. A default or user command may, however, specify some number less than 19 as the maximum count per pixel to be added. (Previously the maximum count per pixel was always 1.)

The default commands in version 7807 are set so that these new capabilities will not be activated unless requested by entering the appropriate user commands.

5.3 USAGE

A new TOLERANCE command (see appendix A) has been added to the CLASSIFY program. This command specifies the distance in radiance units from the spectral limits within which a non-water pixel will be considered "spectrally close" to water. Typical suggested use of this new command is shown below.

TOLERANCE,0	,, (default)
TOLERANCE,1	,, (for sun angles 30° ~ 40°)
TOLERANCE,2	,, (for sun angles 40° ~ 50°)
TOLERANCE,3	,, (for sun angles 50° ~ 60°)

These suggested values are experimental and preliminary, and should be used with caution.

Even though a non-zero tolerance has been specified to CLASSIFY, the PRTCLASS program will generate the same maps as if the default zero tolerance had been used unless the user overrides the default commands in PRTCLASS.

The DENSITY command in PRTCLASS has been extended so that the user can specify all of the following:

- o Minimum density
- o Maximum density
- o Maximum count per pixel

Default values for the DENSITY command are:

DENSITY,10,19,1

This will use every pixel which has a density between 10 and 19 (100 percent water), adding 1 count to the print character for each of these pixels. This is equivalent to the default output from pre-7807 versions of the DAM software.

A typical user-specified DENSITY command to map all water pixels and all "near water" pixels would be:

DENSITY,1,19,5

This will use all pixels which have a non-zero density (100 percent water, or spatially near water, or spectrally near water), adding the value of the pixel density (but not more than 5) to the print character for each of these pixels. All pixels which are 100 percent water or have a high probability of being mixtures of water and land will add a count of 5, while pixels with lesser probabilities of containing any water will add lesser counts. Pixels adjacent spectrally, but not spatially, to water will have a density of 1 and will therefore add a count of 1.

A typical user-specified DENSITY command to map all water pixels and those "near water" pixels contiguous to water pixels might be:

DENSITY,2,19,4

This will use all pixels which have a density greater than 1 (100 percent water, or spatially near at least 2 water pixels, or spatially near 1 water pixel and spectrally near water), adding the value of the pixel density (but not more than 4) to the print character for each of these pixels. All pixels which are 100 percent water or have a high probability of being mixtures of water and land will add a count of 4 while pixels with lesser probabilities will add lesser counts. Pixels adjacent spectrally, but not spatially, to water will be ignored.

See appendix A for detailed syntax of the TOLERANCE and DENSITY commands.

See appendices B and C for examples of the output resulting from the use of these new capabilities.

5.4 INTERPRETATION OF OUTPUT

Appendices B and C show various portions of output maps generated with MSS data using a TOLERANCE of 2 and several different DENSITY specifications. These map fragments all cover small parts of Landsat scene 10037-16244 and utilize the default PRTCLASS symbols (see legend on pages B-3 and C-3).

The 1:24,000-scale map fragments on page B-5 have the default density range of 10 to 19 and the default count per pixel of 1. These specifications produce exactly the same output as the default specifications of software releases prior to version 7807: only 100 percent water pixels are counted and mapped. This is so, even though a tolerance of 2 has been used in creating the detection file.

Inspection of the 7.5-minute topographic quadrangle for this area in southeast Texas shows that a very narrow channel of water actually connects the four seemingly isolated 100 percent water pixels in the vicinity of print line 635 and print column 1521 both with each other and with the larger water body to their left. We would like to detect and map the partial water pixels falling along this narrow channel, while at the same time preserving information about small islands at the following locations:

<u>Print line</u>	<u>Print column</u>	<u>Number of pixels</u>
648	1501	2
627	1499	1
624	1504	1
614	1540	2
614	1532	18

The map fragments on page B-6 have their density range extended to cover non-water pixels with densities of 6 through 9. As a result, all the one- and two-pixel islands disappear, but no pixels along the missing channel appear.

The map fragments on page B-7 have their density range further extended to cover non-water pixels with densities as low as 2. Note that all of the islands have now disappeared. The two separate groups of isolated water pixels in the vicinity of print line 635 and print column 1521 have now coalesced, but have not been linked to the main water body.

On page B-8, the density range has been fully extended to cover even those non-water pixels with densities of 1. Note that a new non-contiguous pixel, midway between the isolated water pixels and the main water body, has now been mapped at print line 637 and print column 1513. Several contiguous pixels have also been added to the main coastline and to the isolated water pixels along the channel, but the complete channel has not been mapped.

We note that the sun elevation angle (page B-2) is 55 degrees. Reclassifying the Landsat tape with a tolerance of 3 instead of 2 might provide better detection of the partially defined channel, but was not attempted for this report.

In all of the above map fragments, pixels that fell within the specified density range were always given a count of 1. As a result, it was not possible to distinguish 100 percent water pixels from "near water" pixels on the maps. Distinguishing between these different types of pixels would allow a better interpretation of the area actually covered by water, and should also make the missing islands re-appear. False detection of marsh was not a problem on these maps, but if it had been, some distinction between pixels based on density would have been even more imperative.

The approach taken is to give each pixel a count equal to its density. However, since pixels with densities over 9 are always 100 percent water, there is no need to distinguish between them, and they all may be given a count of 10. Even in the case of pixels with densities just slightly less than 10, their water probabilities may be so high that we wish to treat them as water pixels. Also by specifying a maximum count per pixel of less than 10 we keep the map symbols mostly numeric (at least for 1:24,000 maps).

On any map, regardless of scale, to find the number of water pixels that have registered to a given print character, we take the total count for that character (given by its symbol) and divide it by the maximum count per pixel:

$$\text{COUNT} \div \frac{\text{COUNT}}{\text{PIXEL}} = \text{COUNT} \cdot \frac{\text{PIXEL}}{\text{COUNT}} = \text{PIXELS}$$

When "near water" pixels are involved, such a computation can result in a fractional answer. The easiest way to think of this fractional result is as the estimated proportion of the pixel that is water. Thus, the total size of a water body in pixels can be estimated by adding the count values for all its print

characters and dividing by the maximum count per pixel used in generating the map. Of course, this result will differ somewhat depending on the count per pixel actually used.

The map fragments on page B-9 were generated with a maximum count per pixel of 2. Note that some print characters at the edge of water bodies have counts of 1: these should be interpreted as "fractional" pixels (one-half pixel). After searching in vain for "fractional" pixels corresponding to islands in the lake, we conclude that a maximum count per pixel of 2 is not sufficient. This is also true for a value of 3, as shown on page B-10.

On page B-11, the maximum count per pixel has been increased to 4. Note that several characters in the 18-pixel island near print line 614 and print column 1532 are symbolized for the first time as containing "fractional" pixels. However, none of the smaller islands are evident.

On page B-13, using a maximum count per pixel of 10, the 2 pixels in the island at print line 614 and print column 1540 are symbolized as $7/10$ water. Note, however, that the other 2-pixel island (at print coordinates 648, 1501) is masked by the effects of registration. None of the 1-pixel islands are visible.

The map fragments on page B-12 with a maximum count per pixel of 5, will likely prove easier to work with, since almost all of the symbols are numeric. A value in the neighborhood of 5 probably provides a reasonable compromise between the competing demands of map intelligibility and map detail. Note that characters in the 18-pixel island are symbolized as three-fifths water or four-fifths water.

At the smaller scale of 1:62,500, more pixels (up to 9) register to each print character, resulting in even higher total counts per character. Appendix C illustrates this for several different density ranges and counts per pixel.

6. REFERENCES

1. Detection and Mapping Package Analysts Guide: Interpreting Impounded Surface Water. NASA/JSC (Houston), JSC-13970, September 1978.
2. Detection and Mapping Package Volume 1: General Procedure. NASA/JSC (Houston), JSC-11376, June 1976.
3. Detection and Mapping Package Volume 2a: Software User Manual (part 1). NASA/JSC (Houston), JSC-11377, June 1976.
4. Detection and Mapping Package Volume 2b: Software User Manual (part 2). NASA/JSC (Houston), JSC-11378, June 1976.
5. Detection and Mapping Package Volume 3: Control Network Establishment. NASA/JSC (Houston), JSC-11379, June 1976.
6. Generation and Physical Characteristics of the Landsat-1 and -2 MSS Computer Compatible Tapes. NASA/Goddard Space Flight Center (Greenbelt, Maryland), X-563-75-223, November 1975.
7. Landsat Data Users Handbook. NASA/Goddard Space Flight Center (Greenbelt, Maryland), 76SDS4258, September 1976.

APPENDIX A
DAM SOFTWARE SYNTAX REVISIONS

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****NEWS****NEWS****CA****NEWS****NEWS****
 7602: FLTCLASS NOT AVAILABLE (USE VERSION 5-06)
 7801: ACCEPT JULY 77 TAPE ANNOTATION RECORD
 7802: EXTRACT ATTITUDE & CALIBRATION DATE FROM STAT FILE
 7802: ACCEPT JAN 78 TAPE ID RECORD
 7802: LANDSAT-2 WATER LIMITS & TRANSFORMS
 7804: REVISED WATER LIMITS & TRANSFORMS
 7804: FIXES FOR UNIVAC PRINTER I/O BUGS
 7807: REVISED PRINTER & DENSITY COMMANDS
 7807: NEW FITCOP PROGRAM
 7807: NEW TOLERANCE COMMAND
 7807: MORE OFF/ON MODE OPTIONS
 7807: LARGER DISPLAY/MAP PRINT FILES
 7807: FIX FOR DENSITY FILE HEAD2N BUFFER LINE ERROR

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PICTAB PROGRAM
=====

THIS PROGRAM PRODUCES DISPLAYS AND TABULATIONS FROM RAW LANDSAT
MSS DATA RECORDED ON A COMPUTER-COMPATIBLE TAPE.

RUNSTREAM

...

@ASG,<OPTIONS> 3.,<TAPE UNIT TYPE>,<REEL NUMBER>

@REWIND 3.

@XQTC,F3 PICTAB

ALILCNJ,SCAENJ,<LINE>,<SAMPLE>,<EARTH COORDINATE SYSTEM>,
 <COORDINATE PAIR>
CHANNELJF,RAW OR LINEARJ OR POLARJJC,<CHANNEL NUMBER>C, ... JJ
CLEARJF,<DIAGNOSTIC TYPE>J
COPIESJF,<NUMBER OF OUTPUT COPIES>J
DISPLAYJF,<DATA TYPE>J
EXPLAINJF,<PROGRAM OR COMMAND NAME>C, ... JJ
FACTORSJ
HEADINGJF,<LINE NUMBER>,<HEADING TEXT>J
LINEARJF,<LINEAR CHANNEL NUMBER>C,<COEFFICIENT TYPE>C,<COEFF(S)>JJJ
NAMECJF,<NAME OF TRANSFORM>J
NEWSJF,<PROGRAM NAME>C, ... JJ
NEXT IFJ,<OFF OR ON>,<MODE OPTION>
OFFC,<MODE OPTION>C, ... JJ
ONC,<MODE OPTION>C, ... JJ
ORIGINJF,<COORDINATE SYSTEM>,<COORDINATE PAIR>J
PAGEJF,<MESSAGE>J
POLARJF,<POLAR CHANNEL NUMBER>C,<COEFFICIENT TYPE>C,<COEFF>JJJ
PRIINTERJF,<METRIC>C,<SPECIFICATIONS>JJ
PROCFJFJ
RADIANCEJF,<MINIMUM>,<MAXIMUM>C, ... JJ
REWINDOWJF,<NEW WINDOW NUMBER>
ROTATEJF,<CRITERIA>C,<MATRIX>C,<NORMALIZATION>JJJ
SHAPPEJF,<CHANNEL NUMBER>C,<SAMPLE>C,<COEFF>,<COEFF>JJJ
SPACINCJF,<LINE INCREMENT>,<SAMPLE INCREMENT>J
SYMBOLSJF,<SYMBOL>,<NUMBER>C,<SYMBOL>,<NUMBER>JJ
TABULATEJF,<DATA TYPE>J
TICK INTERVALJF,<PRIMARY COORDINATE SYSTEM>,<COORDINATE PAIR>,
 <SECONDARY COORDINATE SYSTEM>,<COORDINATE PAIR>J
WINDOWJF,<COORDINATE SYSTEM>C,<COORDINATE PAIR>C, ... JJJ
ZONCEJF,<UTH ZONE NUMBER>J

...

EXITJ

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```

{ @FREE 3.
  @REWIND 3.
  @LOCATE, E 3., <LANDSAT STRIP NUMBER> }
...

```

DAM.PICTAB-1-4

```

@LOCATE, LE 3., 1
@XYOT, E PICTAB
@EOF
@LOCATE, L 3., 2
@XYOT PICTAB
@EOF
@LOCATE, LE 3., 2
@XYOT, E PICTAB
@EOF
@LOCATE 3., 3
@XYOT PICTAB
@EOF
@LOCATE, LE 3., 3
@XYOT, F PICTAB
@EOF
@LOCATE 3., 4
@XYOT PICTAB
@EOF
@LOCATE, LE 3., 4
@XYOT, F PICTAB
@EOF

```

CLASSIFY PROGRAM =====

THIS PROGRAM GENERATES A DENSITY FILE FROM A LANDSAT MSS TAPE.

PUNSTREAM

...

@ASG,<OPTIONS> 3.,<TAPE UNIT TYPE>,<REEL NUMBER>

@REWIND 3.

@LOCATEC,EJ 3.,<LANDSAT STRIP NUMBER>

@XQTC,EJ CLASSIFY

{
CHANNELJC,RAW OF LINEARJC OR POLARJCJC,<CHANNEL NUMBER>C, ... JJ
CLEARJC,<DIAGNOSTIC TYPE>JJ
COPIESJC,<NUMBER OF OUTPUT COPIES>JJ
DETECTJC
EXPLAINJC,<PROGRAM OR COMMAND NAME>C, ... JJ
HEADINGJC,<LINE NUMBER>,<HEADING TEXT>JJ
LINEARJC,<LINEAR CHANNEL NUMBER>C,<COEFFICIENT TYPE>C,<COEFF(S)>JJJ
NAMEJC,<NAME OF MATERIAL DETECTED>JJ
NEWJC,<PROGRAM NAME>C, ... JJ
NEXT IFJC,<OFF OR ON>,<MODE OPTION>
OFFC,<MODE OPTION>C, ... JJ
ONC,<MODE OPTION>C, ... JJ
ORIGINJC,<COORDINATE SYSTEM>,<COORDINATE PAIR>JJ
PAGEJC,<MESSAGE>JJ
POLARJC,<POLAR CHANNEL NUMBER>C,<COEFFICIENT TYPE>C,<COEFF>JJJ
PRINTERJC,<METRIC>C,<SPECIFICATIONS>JJ
RADIANCEJC,<MINIMUM>,<MAXIMUM>C, ... JJ
SHARPENINGJC,<CHANNEL NUMBER>C,SAMPLEJC,<COEFF>,<COEFF>JJJ
TOLERANCEJC,<TOLERANCE IN RADIANCE>JJ
WINDOWJC,<COORDINATE SYSTEM>C,<COORDINATE PAIR>C, ... JJJ
ZONEJC,<UTH ZONE NUMBER>JJ
}

...

EXITJC

{
@FREE 3.
@REWIND 3.
@LOCATEC,EJ 3.,<LANDSAT STRIP NUMBER> }
}

...

NOTES

1. CONTROL MUST BE EXECUTED IN THE SAME RUN, PRIOR TO CLASSIFY.

DAM.CLASSIFY-1-4

```
DLLOCATE,LE 3.,1
DXQT,E CLASSSSIFY
DEOF
DLLOCATE,L 3.,2
DXQT CLASSSSIFY
DEOF
DLLOCATE,LE 3.,2'
DXQT,E CLASSSSIFY
DEOF
DLLOCATE 3.,3
DXQT CLASSSSIFY
DEOF
DLLOCATE,LE 3.,3
DXQT,E CLASSSSIFY
DEOF
DLLOCATE 3.,4
DXQT CLASSSSIFY
DEOF
DLLOCATE,LE 3.,4
DXQT,E CLASSSSIFY
DEOF
```

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PRTCLASS PROGRAM =====

THIS PROGRAM PRODUCES LINE-PRINTER MAPS FROM DENSITY FILES
PREVIOUSLY CREATED BY THE CLASSIFY PROGRAM.

RUNSTREAM -----

...

@XQTE,ED PRTCLASS

```

{
CLEARJC,<DIAGNOSTIC TYPE>J
COPIESJC,<NUMBER OF OUTPUT COPIES>J
DENSITYJC,<MINIMUM>,<MAXIMUM>C,<COUNTS/PIXEL>JJ
EXPLAINJC,<PROGRAM OR COMMAND NAME>C,<... >J
HEADINGJC,<LINE NUMBER>,<HEADING TEXT>J
MAPJC,<MAXIMUM NUMBER OF SUB-WINDOWS>J
NEWSJC,<PROGRAM NAME>C,<... >J
NEXT IFJ,<OFF OR ON>,<MODE OPTION>
OFFC,<MODE OPTION>C,<... >J
ONC,<MODE OPTION>C,<... >J
ORIGINJC,<COORDINATE SYSTEM>,<COORDINATE PAIR>J
PAGEJC,<MESSAGE>J
PRINTERJC,<MLTRIC>L,<SPECIFICATIONS>JJ
RENUMBERJC,<NEW WINDOW NUMBER>
SCALEJC,1/<DENOMINATOR OF REPRESENTATIVE FRACTION>J
SYMBOLSJC,<SYMBOL>,<NUMBER>C,<SYMBOL>J,<NUMBER>JJ
TICK INTERVALJC,<PRIMARY COORDINATE SYSTEM>,<COORDINATE PAIR>,<
    <SECONDARY COORDINATE SYSTEM>,<COORDINATE PAIR>J
WINDOWJC,<COORDINATE SYSTEM>C,<COORDINATE PAIR>C,<... >JJ
ZONEJC,<UTM ZONE NUMBER>J

```

...

EXITJ

...

NOTES -----

1. CLASSIFY MUST BE EXECUTED IN THE SAME RUN, PRIOR TO PRTCLASS.
2. UPON EXIT, PRTCLASS DESTROYS THE DENSITY FILES UNLESS SAVE HAS BEEN SPECIFIED.

DENSITY COMMAND =====

DENSITYJC,<MINIMUM>,<MAXIMUM>C,<COUNT PER PIXEL>]]

EXPLANATION -----

THIS COMMAND SPECIFIES THE DENSITY RANGE TO BE USED IN PROCESSING SUBSEQUENT WINDOWS. DENSITY IS A DECIMAL NUMBER WHOSE DIGITS HAVE THE FOLLOWING SIGNIFICANCE:

TENS DIGIT: 0 = OUTSIDE SPECTRAL LIMITS, 1 = INSIDE LIMITS

UNITS DIGIT: NUMBER OF ADJACENT PIXELS (8 MAX) INSIDE LIMITS, PLUS 1 IF PIXEL IS OUTSIDE LIMITS BUT WITHIN TOLERANCE

EXAMPLES -----

DENSITY,10,10 ,, ISOLATED PIXELS CLASSIFIED WITHIN SPECTRAL LIMITS
DENSITY,01,09 ,, ADJACENT IN SPACE OR RADIANCE TO PIXEL(S) IN LIMITS
DENSITY,11,19 ,, NON-ISOLATED PIXELS WITHIN SPECTRAL LIMITS
DENSITY,10,19 ,, ALL PIXELS WITHIN SPECTRAL LIMITS
DENSITY,01,19 ,, PIXELS WITHIN SPECTRAL LIMITS OR ADJACENT
DENSITY,01,10,2 ,, SAME, BUT COUNT/PIXEL IS MINIMUM OF DENSITY AND 2

RESTRICTIONS -----

1. VALID DENSITIES ARE FROM 0 TO 19, INCLUSIVE.
2. VALID COUNT PER PIXEL IS FROM 1 TO 12, INCLUSIVE.
3. COUNT PER PIXEL IS IGNORED BY PRDENS AND PLTCLASS.

PROGRAMS -----

PRDENS
PRTCLASS
PLTCLASS

OFF COMMAND -----

```

OFFC, { BATCHJ
        CHECKOUTJ
        CONFIRMJ
        DEFAULTJ
        ECHOJ
        LEGENDJ
        PROMPTJ
        TRACEJ } I, ... JJ

```

EXPLANATION -----

THIS COMMAND TURNS OFF ANY OF THE FOLLOWING MODE OPTIONS:

BATCH	PROCESS AS BATCH
CHECKOUT	CHECK ALL COMMANDS BUT DO NOT PERFORM THEM
CONFIRM	PRINT CONFIRMATION OF COMMAND SPECIFICATIONS
DEFAULT	PROCESS DEFAULT COMMANDS (NOT AVAILABLE TO USER -- MAY NOT BE COMBINED WITH ANY OTHER OPTION)
ECHO	ECHO INPUT COMMAND STATEMENTS
LEGEND	PRINT SYMBOL LEGENDS & TICK TABLES
PROMPT	NOT YET IMPLEMENTED
TRACE	TRACE PROGRAM FLOW (FOR USE IN DEBUGGING SOFTWARE)

EXAMPLES -----

OFF,CHECKOUT,ECHO

RESTRICTIONS -----

1. MODE OPTIONS NOT SPECIFIED REMAIN UNCHANGED.

PROGRAMS -----

ALL PROGRAMS

ON COMMAND

```

ONE, { BATECH
      CHECKOUT
      CONFIRM
      DEFAULT
      ECHO
      LEGEND
      PROMPT
      TRACE } [, ... ]

```

EXPLANATION

THIS COMMAND TURNS ON ANY OF THE FOLLOWING MODE OPTIONS:

BATCH	PROCESS AS BATCH
CHECKOUT	CHECK ALL COMMANDS BUT DO NOT PERFORM THEM
CONFIRM	CONFIRM COMMAND SPECIFICATIONS
DEFAULT	PROCESS DEFAULT COMMANDS (NOT AVAILABLE TO USER -- MAY NOT BE COMBINED WITH ANY OTHER OPTION)
ECHO	ECHO INPUT COMMAND STATEMENTS
LEGEND	PRINT SYMBOL LEGENDS & TICK TABLES
PROMPT	NOT YET IMPLEMENTED
TRACE	TRACE PROGRAM FLOW (FOR USE IN DEBUGGING SOFTWARE)

EXAMPLES

ON,CHECKOUT,ECHO

RESTRICTIONS

1. MODE OPTIONS NOT SPECIFIED REMAIN UNCHANGED.

PROGRAMS

ALL PROGRAMS

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PRINTER COMMAND =====

```
PRINTERJC, ( INCHJC, <LINES>JC, <COLUMNS>JC ) ]
            { PAGEJC, <LINES>JC, <COLUMNS>JC ]
              DEVICEJC, <SYSTEM MNEMONIC>JC ]
              FILESCJC, <NUMBER OF FILES>JC ]
              CONTROLJC, { AUTOJC
                          { MANUALJC
                          { NONEJC } } ]
            }
```

EXPLANATION -----

THIS COMMAND IS USED TO OVERRIDE THE NORMAL PRINTER CHARACTERISTICS FOR ALTERNATE PRINT FILES AT A COMPUTER INSTALLATION.

EXAMPLES -----

```
PRINTER, INCH, 8, 10      ,, 8 LINES/INCH & 10 COLUMNS/INCH
PRINTER, PAGE, 88, 132    ,, 88 LINES/PAGE & 132 COLUMNS/PAGE
PRINTER, DEVICE, RMSP19   ,, ROUTE PRINT FILE(S) TO REMOTE SITE RMSP19
PRINTER, CONTROL, NONE    ,, NO CONTROL OVER LINES/INCH ON PRINTER
```

RESTRICTIONS -----

1. THIS COMMAND SHOULD BE USED RARELY, AND THEN ONLY BY PERSONNEL FAMILIAR WITH THE LOCAL SYSTEMS SOFTWARE.
2. THIS COMMAND MAY BE USED ONLY BEFORE THE FIRST WINDOW IN THE CURRENT PROGRAM HAS BEEN PROCESSED.

PROGRAMS -----

```
PICTAB
CLASSIFY
PRIDENS
PRICLASS
```

1 7337

TOLERANCE COMMAND
=====

TOLERANCE[*i*,<TOLERANCE IN RADIANCE>]

EXPLANATION

THIS COMMAND SPECIFIES THE TOLERANCE TO BE APPLIED IN CLASSIFYING PIXELS OUTSIDE THE SPECTRAL LIMITS AS 'NEAR HITS'. (A TOLERANCE OF 0 SPECIFIES NO 'NEAR HITS'.)

EXAMPLES

TOLERANCE,2

RESTRICTIONS

1. VALID TOLERANCE VALUES ARE FROM 0 TO 6, INCLUSIVE.

PROGRAMS

CLASSIFY

ORIGINAL PAGE IS
OF POOR QUALITY

APPENDIX B

SAMPLE PRTCLASS OUTPUT AT 1:24,000

^

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170ESX/170ESX

DAM PRTCLASS(7807)

44 44
44 44
44 44
44 44
44 44
444444444444
444444444444
44
44
44
44
44

888888
88888888
88 88
88 88
88 88
888888
8888888888
888 888
88 88
888 888
8888888888
88888888

=====
HOUR

=====
MINUTE

ERTS SCENE: 10037-16244
DATE: 29 AUG 72
SUN ELEV: 55 DEGREES
SUN AZIMUTH: 121 DEGREES

CCT STRIPS:	1	2	3	4
DATE CLASSIFIED:	110278			
MINIMUM LINE:	0	1	0	0
MAXIMUM LINE:	0	801	0	0
MINIMUM SAMPLE:	0	811	0	0
MAXIMUM SAMPLE:	0	1620	0	0
MATERIAL CLASSIFIED:	WATER CH4/CH1 ERTS-1			
TOLERANCE:				

DENSITY RANGE:
COUNT PER PIXEL:

ORIGIN: 30:52:30.0 LAT, 95:15:00.0 LON

MAP SCALE: 1:24000
PROJECTION: TRANSVERSE MERCATOR
SPHEROID: CLARKE 1866
CENTRAL MERIDIAN: 95.3100 DEGREES

CONTROL: 18 POINTS COVERING 85. PERCENT OF ERTS SCENE
ROOT MEAN SQUARE ERROR: 66. METERS

ORIGINAL PAGE IS
OF POOR QUALITY

170ESX/170ESX DAM PRTCLASS(7807)

SYMBOLS FOR COUNT OF PIXELS CLASSIFIED WITHIN
SPECTRAL LIMITS AND DENSITY RANGE

SYMBOL	NUMBER	MEANING
:		NO DATA
*		PRIMARY TICK
+		SECONDARY TICK
(BLANK)	000	
1	001	
2	002	
3	003	
4	004	
5	005	
6	006	
7	007	
8	008	
9	009	
A	010-014	
B	015-019	
C	020-024	
D	025-029	
E	030-034	
F	035-039	
G	040-044	
H	045-049	
I	050-054	
J	055-059	
K	060-064	
L	065-069	
M	070-074	
N	075-079	
O	080-084	
P	085-089	
Q	090-094	
R	095-099	
S	100-109	
T	110-119	
U	120-129	
V	130-139	
W	140-149	
X	150-159	
Y	160-169	
Z	170-255	

ORIGINAL PAGE IS
OF POOR QUALITY

170ESX/170ESX

DAM PRTCLASS(7807)

TICK SYMBOL	SCANNER LINE SAMPLE	(DEG:MIN:SEC) LATITUDE LONGITUDE	PRINTER LINE COLUMN
*	185.81 1163.05	31:00:00 95:22:30	494 1368
*	158.96 1365.59	31:00:00 95:15:00	466 1560
*	355.45 1221.57	30:52:30 95:22:30	673 1409
*	328.56 1424.35	30:52:30 95:15:00	645 1602
+	185.81 1163.05	31:00:00 95:22:30	494 1368
+	176.88 1230.58	31:00:00 95:20:00	485 1432
+	167.93 1298.09	31:00:00 95:17:30	475 1496
+	158.96 1365.59	31:00:00 95:15:00	466 1560
+	242.36 1182.56	30:57:30 95:22:30	554 1382
+	233.42 1250.12	30:57:30 95:20:00	545 1446
+	224.47 1317.65	30:57:30 95:17:30	535 1510
+	215.50 1385.17	30:57:30 95:15:00	526 1574
+	298.90 1202.07	30:55:00 95:22:30	614 1395
+	289.96 1269.65	30:55:00 95:20:00	604 1459
+	281.00 1337.21	30:55:00 95:17:30	595 1524
+	272.03 1404.76	30:55:00 95:15:00	585 1588
+	355.45 1221.58	30:52:30 95:22:30	673 1409
+	346.50 1289.18	30:52:30 95:20:00	664 1473
+	337.54 1356.77	30:52:30 95:17:30	654 1537
+	328.56 1424.35	30:52:30 95:15:00	645 1602

0463 :
0464 :
0465 :
0466 :
0467 :
0468 :
0469 :
0470 :
0471 :
0472 :
0473 :
0474 :
0475 :
0476 :
0477 :
0478 :
0479 :

ORIGINAL PAGE IS
OF POOR QUALITY

TOLERANCE: 2
DENSITY RANGE: 56 TO 19
COUNT PER PIXEL: 1

TOLERANCE: 2
DENSITY RANGE: 62 TO 19
COUNT PER PIXEL: 1

```

0463:
0464:
0465:
0466:
0467:
0468:
0469:
0470:
0471:
0472:
0473:
0474:
0475:
0476:
0477:
0478:
0479:

```

ORIGINAL PAGE IS
OF POOR QUALITY

TOLERANCE: 2
DENSITY RANGE: 01 TO 19
COUNT PER PIXEL: 1

[illegible]

APPENDIX C

SAMPLE PRTCLASS OUTPUT AT 1:62,500

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170ESX/170ESX DAM PRTCLASS(7807)

44	44	888888	
44	44	88888888	
44	44	88	88
44	44	88	88
44	44	88	88
444444444444		888888	
444444444444		8888888888	
	44	888	888
	44	88	88
	44	888	888
	44	8888888888	
	44	88888888	

=====
HOUR

=====
MINUTE

ERTS SCENE: 10037-16244
DATE: 29 AUG 72
SUN ELEV: 55 DEGREES
SUN AZIMUTH: 121 DEGREES

CCT STRIPS:	1	2	3	4
DATE CLASSIFIED:	0	110278		
MINIMUM LINE:	0	1	0	0
MAXIMUM LINE:	0	801	0	0
MINIMUM SAMPLE:	0	811	0	0
MAXIMUM SAMPLE:	0	1620	0	0
MATERIAL CLASSIFIED:	WATER CH4/CH1 ERTS-1			
TOLERANCE:				

DENSITY RANGE:
COUNT PER PIXEL:

ORIGIN: 30:45:00.0 LAT, 95:15:00.0 LON

MAP SCALE: 1: 62500
PROJECTION: TRANSVERSE MERCATOR
SPHEROID: CLARKE 1866
CENTRAL MERIDIAN: 95.3100 DEGREES

CONTROL: 18 POINTS COVERING 85. PERCENT OF ERTS SCENE
ROOT MEAN SQUARE ERROR: 66. METERS

170ESX/170ESX DAM PRTCLASS(7807)

SYMBOLS FOR COUNT OF PIXELS CLASSIFIED WITHIN
SPECTRAL LIMITS AND DENSITY RANGE

SYMBOL	NUMBER	MEANING
:		NO DATA
*		PRIMARY TICK
+		SECONDARY TICK
(BLANK)	000	
1	001	
2	002	
3	003	
4	004	
5	005	
6	006	
7	007	
8	008	
9	009	
A	010-014	
B	015-019	
C	020-024	
D	025-029	
E	030-034	
F	035-039	
G	040-044	
H	045-049	
I	050-054	
J	055-059	
K	060-064	
L	065-069	
M	070-074	
N	075-079	
O	080-084	
P	085-089	
Q	090-094	
R	095-099	
S	100-109	
T	110-119	
U	120-129	
V	130-139	
W	140-149	
X	150-159	
Y	160-169	
Z	170-255	

ORIGINAL PAGE IS
OF POOR QUALITY

170ESX/170ESX

DAM PRTCLASS(7807)

TICK SYMBOL	SCANNER LINE SAMPLE	(DEG:MIN:SEC) LATITUDE	LONGITUDE	PRINTER LINE COLUMN
*	212.50 960.26	31:00:00	95:30:00	385 636
*	185.81 1163.05	31:00:00	95:22:30	374 710
*	158.96 1365.59	31:00:00	95:15:00	363 784
*	382.17 1018.59	30:52:30	95:30:00	454 651
*	355.45 1221.57	30:52:30	95:22:30	443 726
*	328.56 1424.35	30:52:30	95:15:00	432 800
*	551.84 1076.90	30:45:00	95:30:00	522 667
*	525.08 1280.08	30:45:00	95:22:30	512 741
*	498.15 1483.11	30:45:00	95:15:00	501 815
+	212.50 960.26	31:00:00	95:30:00	385 636
+	203.63 1027.90	31:00:00	95:27:30	382 660
+	194.73 1095.49	31:00:00	95:25:00	378 685
+	185.81 1163.05	31:00:00	95:22:30	374 710
+	176.88 1230.58	31:00:00	95:20:00	371 734
+	167.93 1298.09	31:00:00	95:17:30	367 759
+	158.96 1365.59	31:00:00	95:15:00	363 784
+	269.06 979.71	30:57:30	95:30:00	408 641
+	260.18 1047.36	30:57:30	95:27:30	404 666
+	251.28 1114.98	30:57:30	95:25:00	401 690
+	242.36 1182.56	30:57:30	95:22:30	397 715
+	233.42 1250.12	30:57:30	95:20:00	394 740
+	224.47 1317.65	30:57:30	95:17:30	390 764
+	215.50 1385.17	30:57:30	95:15:00	386 789
+	325.62 999.15	30:55:00	95:30:00	431 646
+	316.73 1066.83	30:55:00	95:27:30	427 671
+	307.83 1134.46	30:55:00	95:25:00	424 696
+	298.90 1202.07	30:55:00	95:22:30	420 720
+	289.96 1269.65	30:55:00	95:20:00	416 745
+	281.00 1337.21	30:55:00	95:17:30	413 770
+	272.03 1404.76	30:55:00	95:15:00	409 794
+	382.17 1018.59	30:52:30	95:30:00	454 651
+	373.28 1086.29	30:52:30	95:27:30	450 676
+	364.37 1153.95	30:52:30	95:25:00	447 701
+	355.45 1221.58	30:52:30	95:22:30	443 726
+	346.50 1289.18	30:52:30	95:20:00	439 750
+	337.54 1356.77	30:52:30	95:17:30	436 775
+	328.56 1424.35	30:52:30	95:15:00	432 800
+	438.73 1038.03	30:50:00	95:30:00	477 657
+	429.83 1105.75	30:50:00	95:27:30	473 681
+	420.92 1173.43	30:50:00	95:25:00	469 706
+	411.99 1241.08	30:50:00	95:22:30	466 731
+	403.04 1308.71	30:50:00	95:20:00	462 755
+	394.08 1376.33	30:50:00	95:17:30	459 780
+	385.09 1443.93	30:50:00	95:15:00	455 805
+	495.28 1057.47	30:47:30	95:30:00	500 662
+	486.38 1125.20	30:47:30	95:27:30	496 687
+	477.47 1192.91	30:47:30	95:25:00	492 711
+	468.53 1260.58	30:47:30	95:22:30	489 736
+	459.58 1328.24	30:47:30	95:20:00	485 761
+	450.61 1395.88	30:47:30	95:17:30	481 785
+	441.62 1463.52	30:47:30	95:15:00	478 810
+	551.84 1076.90	30:45:00	95:30:00	522 667
+	542.94 1144.66	30:45:00	95:27:30	519 692
+	534.02 1212.38	30:45:00	95:25:00	515 717
+	525.08 1280.09	30:45:00	95:22:30	512 741
+	516.12 1347.77	30:45:00	95:20:00	508 766
+	507.15 1415.44	30:45:00	95:17:30	504 791
+	498.15 1483.11	30:45:00	95:15:00	501 815

```

C360: 31
C361: 11
C362:
C363: *
C364:
C365:
C366: 2
C367: + 4
C368: 3
C369:
C370:
C371:
C372:
C373:
C374:
C375:
C376:
C377:
C378:
C379:
C380:
C381:
C382:
C383:
C384:
C385:
C386:
C387:
C388:
C389:
C390:
C391: +
C392:
C393:
C394:
C395:
C396: 253
C397: 8776 3787
C398: 6356661156463 32
C399: 99788887999787985
C400: 66655666466646665241 134612 369445 646663
C401: 36664666556664666464 166466655666463
C402: 67999789987999699978465199969967899841
C403: 664524466655666466646665536646664666
C404: 9986 6969997699879997899879996999315
C405: 4665466546665566646664666556664655
C406: 389983379695858998799969997899841
C407: 1112466556655666466556661
C408: 146876998769969997899
C409: 346664115646665562
C410: 5451 29996616773
C411: 21662 45
C412: 3498694
C413: 243332 2
C414: 358987941
C415: 565666466644443341
C416: 3366969789553 24999379855333
C417: 2455666466463 35566466545
C418: 2366655666452 11566566641
C419: 2 1354999699978952 7957699852
C420: 33366632 1426651 136655666
C421: 2399978652333233 35978994
C422: 1466441 1555562
C423: 97894 15637
C424: 156632 143
C425: 87899 260
C426: 664661 53
C427: 99634 2562
C428: 5563 22
C429: 7899851
C430: 646661
C431: 997892

```

DENSITY RANGE: 06 TO 19
COUNT PER PIXEL: 1

```

0360: 232 0360:
0361: 154 0361:
0362: 0362:
0363: 0363:
0364: 0364:
0365: 39 0365:
0366: 13 0366:
0367: + 261 0367:
0368: 163 0368:
0369: 0369:
0370: 0370:
0371: 0371:
0372: 0372:
0373: 0373:
0374: 0374:
0375: 0375:
0376: 0376:
0377: 0377:
0378: 0378:
0379: 0379:
0380: 0380:
0381: 0381:
0382: 0382:
0383: 0383:
0384: 0384:
0385: 0385:
0386: 0386:
0387: 0387:
0388: 0388:
0389: 0389:
0390: 0390:
0391: 0391:
0392: 0392:
0393: 0393:
0394: 0394:
0395: 23 0395:
0396: 4663 1233 0396:
0397: 8799422 87893 0397:
0398: 65566645664664553 0398:
0399: 99739987999789987321 0399:
0400: 66655666466646665565 15466653 346466651 0400:
0401: 456546665566646664661 4664666556664663 0401:
0402: 87999789987999699978998799969997899874 0402:
0403: 66466646665566646664666556646664666 0403:
0404: 998759959997899879997899879996999789987 0404:
0405: 66655666466655666466646665566646662 0405:
0406: 78998779969997899879996999789987731 0406:
0407: 123332 46646665566556664666556664 0407:
0408: 248997899879996999789987 0408:
0409: 3646665456646665565 0409:
0410: 397853 69996959786 0410:
0411: 2566644663 0411:
0412: 179987981 0412:
0413: 2556654546 0413:
0414: 3978998799532532 0414:
0415: 466556664666466556532533 0415:
0416: 2367969997599879997777 0416:
0417: 26655666466646641 6055665466546 0417:
0418: 136466655666466371 25536665566646 0418:
0419: 25 266679996999789953 149997899875 0419:
0420: 266466655666466643 24666556662 0420:
0421: 266999789946665564 123399789983 0421:
0422: 253666465321 15556664 0422:
0423: 59789832 1597894 0423:
0424: 4565451 5451 0424:
0425: 879994 6992 0425:
0426: 664664 1466 0426:
0427: 998782 13 5876 0427:
0428: 556633 266 0428:
0429: 78998761 13 0429:
0430: 646664 0430:
0431: 997396 0431:

```

```

0360: 364 0360:
0361: 197 0361:
0362: 0362:
0363: * 0363:
0364: 0364:
0365: 38 0365:
0366: 15 0366:
0367: 4A1 0367:
0368: 1A5 0368:
0369: 0369:
0370: 0370:
0371: 0371:
0372: 0372:
0373: 0373:
0374: 0374:
0375: 0375:
0376: 0376:
0377: 0377:
0378: 0378:
0379: 0379:
0380: 0380:
0381: 0381:
0382: 0382:
0383: 0383:
0384: 0384:
0385: 0385:
0386: 0386:
0387: + 0387:
0388: 3 0388:
0389: 7 0389:
0390: 0390:
0391: 15 0391:
0392: 2A 0392:
0393: 143 0393:
0394: 1A786 0394:
0395: 17A2 0395:
0396: 591 0396:
0397: 46A5 0397:
0398: 5ABA32 0398:
0399: 4AA9A5 0399:
0400: 0400:
0401: 0401:
0402: 0402:
0403: 0403:
0404: 0404:
0405: 0405:
0406: 0406:
0407: 0407:
0408: 0408:
0409: 0409:
0410: 0410:
0411: 0411:
0412: 0412:
0413: 0413:
0414: 0414:
0415: 0415:
0416: 0416:
0417: 0417:
0418: 0418:
0419: 0419:
0420: 0420:
0421: 0421:
0422: 0422:
0423: 0423:
0424: 0424:
0425: 0425:
0426: 0426:
0427: 0427:
0428: 0428:
0429: 0429:
0430: 0430:
0431: 0431:

```

[illegible]


```

0360: 4A6 0360:
0361: 1AA 0361:
0362: 0362:
0363: * 0363:
0364: 0364:
0365: 3B 0365:
0366: 16 0366:
0367: + 4C1 0367:
0368: 1C5 0368:
0369: 0369:
0370: 0370:
0371: 0371:
0372: 0372:
0373: 0373:
0374: 0374:
0375: 0375:
0376: 0376:
0377: 0377:
0378: 0378:
0379: 0379:
0380: 0380:
0381: 0381:
0382: 0382:
0383: 0383:
0384: 0384:
0385: 0385:
0386: 0386:
0387: + 0387:
0388: 3 0388:
0389: 9 0389:
0390: 0390:
0391: + 15 0391:
0392: 2B 0392:
0393: 153 0393:
0394: 1B7A8 0394:
0395: 1AB2 0395:
0396: 5A1 0396:
0397: 66C7 0397:
0398: 5DEB32 0398:
0399: 7CCAB7 0399:
0400: 4BDA 3BEFFDE3 0400:
0401: 1ABCCCB79ACBCCCB1 0401:
0402: ACCBCCCCCCCCCBCC6 0402:
0403: EDFFFDEFFEDFFFCFFFDDEEDCFFFCFFFDFFFD9 0403:
0404: CCBCBCBCCCCCCCCBCCCCCCCCBCCCCBCCCC6 0404:
0405: FFEDAEEFCFFFDFFFDFFFDFFFDFFFCFFFDDBD3 0405:
0406: CCCCCCCCCBCCCCBCCCCCCCCCCCCBCCC4 0406:
0407: CEFFECCEFCFFFDFFFDFFFCFFFDFFFDDB51 0407:
0408: 159994 8BBBCCCCCCCCCCCCCCCCCCCCA 0408:
0409: 3ADEFFDEFFEDFFFCFFFDFFFA 0409:
0410: 6CBCCCB7BCCBCCCCCB 0410:
0411: 5DDDA7 BFFFCFAEDEC 0411:
0412: 2BBCCABCC5 0412:
0413: 1CFFEDF01 0413:
0414: 3BCCCCBAAA 0414:
0415: 3DDEFFEDFEA96993 33 0415:
0416: 9CCCCCBCCCCBCCBCCA96996 3 0416:
0417: 38CCECFDEFFDECA139DDEFFEDFFEDCCD 0417:
0418: 3BCCCCCBCCBCCA1 BCBCCCCBCCCCBCC6 0418:
0419: 18BBCCCCCCCCCBBCB951 3A97CCCCCCCCBBA 0419:
0420: 2B 3BCD0FFFCFFFEFEA7 19EFFDEFFEDB 0420:
0421: 2CCBCCCCCBCCBCCA6 2ACCCCCCCC7 0421:
0422: 3BCFFFDEEEAACCBBCB 125CEFDEFFD4 0422:
0423: 3A8CCCBCA951 1ACCCCCA 0423:
0424: AFDEFD83 1AEDEF5 0424:
0425: ACCCB1 ABC1 0425:
0426: EDFFFA AEE3 0426:
0427: CCBCCA 17CB 0427:
0428: FFECC3 15 BDD8 0428:
0429: CCCC86 38B 0429:
0430: DEFFEDA1 15 0430:
0431: CBCCCA 0431:
0432: FFDEFB 0432:
TOLERANCE: 2
DENSITY RANGE: 01 TO 19
COUNT PER PIXEL: 4

```